

1970

**OPERATING
SUMMARY**

MIDLAND

***water pollution
control plant***

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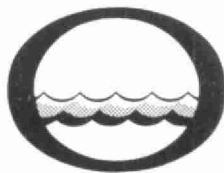
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Water management in Ontario

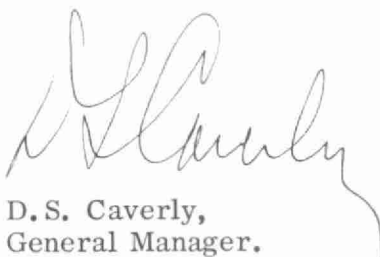
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario


Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D. S. Caverly,
General Manager.



D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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water pollution control plant

operated for

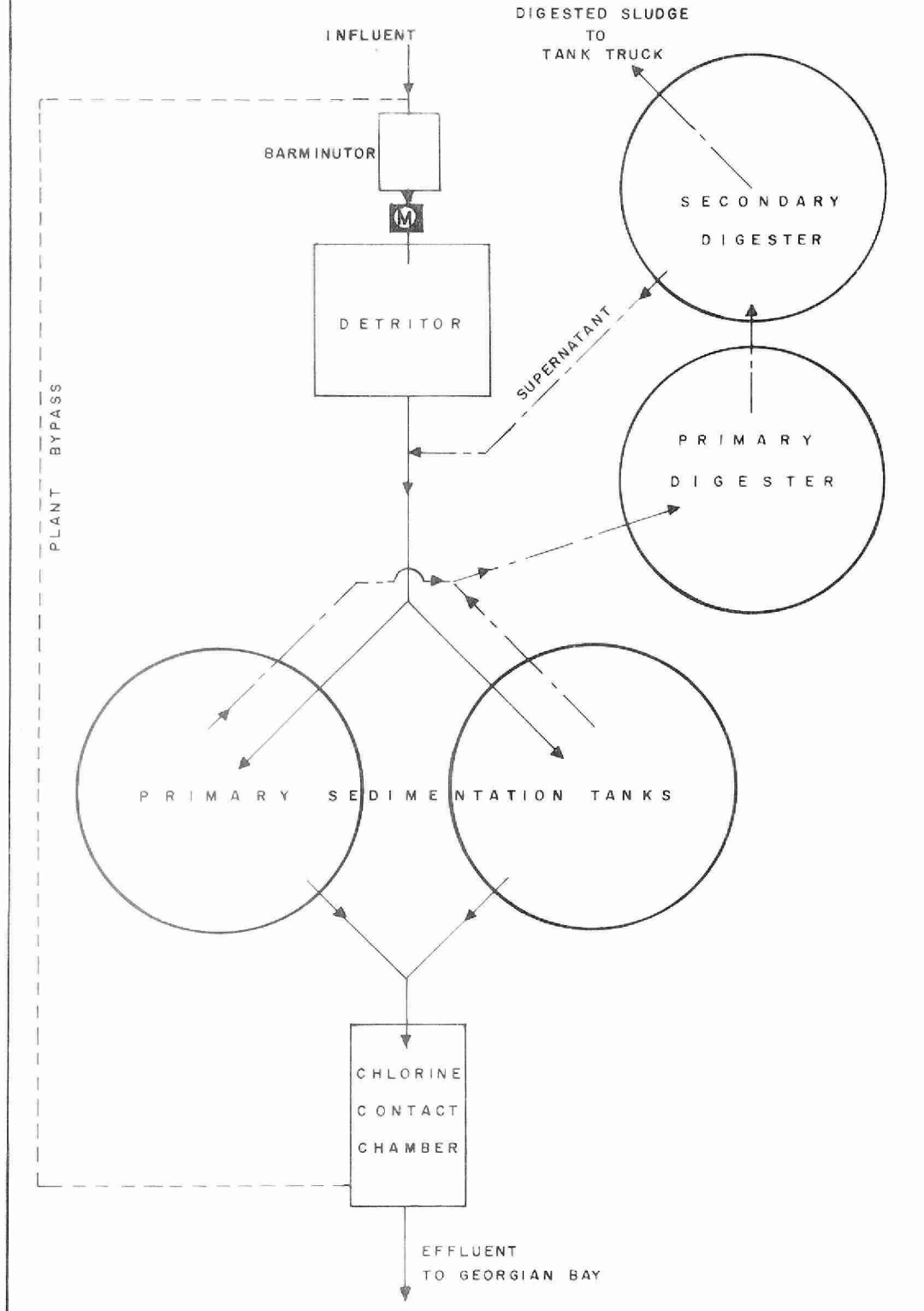
THE TOWN OF MIDLAND

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY

MIDLAND WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO.	2-0146-63	TREATMENT	Primary
DESIGN FLOW	1.25 mgd	DESIGN POPULATION	12,500
BOD - Raw Sewage	225 mg/l	SS - Raw Sewage	300 mg/l
- Removal	40%	- Removal	60%

PRIMARY TREATMENT

Comminution

Type: Barminutor
Size: One Model C

Grit Removal

Type: Dorr Detritor
Size: One 12' x 12' x 16" (1,200 gal)
Retention: 1.38 min

Primary Sedimentation

Type: Dorr
Size: Two 50' dia x 8' swd (195,000 gal)
Retention: 3.75 hours
Loading: Surface, 319 gal/ft²/day
Weir, 3970 gal/ft/day

CHLORINATION

Type: W & T, Type A711 (Auto)
Size: One 1000 lb/day

Chlorine Contact Chamber

Size: Irregular (16,200 gal)
Retention: 18.7 min

OUTFALL

- 615' of 24" pipe to Georgian Bay

SLUDGE HANDLING

Digestion System - Two-stage

Primary --

Type: Babcock-Wilson
Draft tube mixers (2)
Size: One 30' dia x 22' (15,600 cu ft or
97,200 gal)
Loading: 4.3 lb/cu ft/mo

Secondary --

Type: Fixed steel cover
Size: One 30' dia x 21½' (15,200 cu ft or
94,600 gal)
Total Loading: 2.2 lb/cu ft/mo

PUMPING STATIONS

#1 Pumping Station

Type: Worthington
Size: Two 780 gpm @ 37' tdh
One 2600 gpm @ 60' tdh

#2 Pumping Station

Type: Flygt (submersible)
Size: Two 83 gpm @ 30' tdh

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	1.33	—	40.5	—
High	1.58	April	47.4	April
Low	1.17	Jan. - Feb.	32.8	February

GENERAL

In addition to the treatment plant, four pumping stations were maintained by the plant staff during 1970. The Vinden Street Pumping Station required the replacement of one of the service pumps early in the year. New pyrotenax cables were installed to the clarifiers and digester building at the treatment plant. The original cables had deteriorated.

EXPENDITURE

The total operating cost of the system in 1970 was \$34,075.73. Approximately 50% of this sum represented salaries.

The cost per million gallons of sewage treated was \$70 and the cost per pound of BOD removed was 13.5 cents.

PLANT FLOWS and CHLORINATION

Total flow to the plant during the year was 485.4 million imperial gallons for an average of 1.33 mgd, slightly above the nominal design flow of 1.25 mgd.

The greatest daily flow recorded was 2.3 million gallons. This figure was attained during runoff in March and April while the lowest daily flow of 0.8 million gallons was recorded in January.

A total of 32,900 pounds of chlorine was used to disinfect the plant effluent. This represented an average dosage of 6.8 mg/l.

PLANT EFFICIENCY

On the average, the plant influent BOD concentration was reduced 37% from 118 mg/l to 74 mg/l. The average reduction in suspended solids was 63%; from 202 mg/l to 74 mg/l. This was an increase in removal efficiency from 1969.

A total of 804 cubic yards of grit was removed from the raw sewage in the detritor unit.

SLUDGE DIGESTION and DISPOSAL

A total of 948,000 gallons of sludge averaging 10.6% total solids was removed from the primary clarifiers. This was pumped to the digesters from which 1638 cubic yards of digested sludge averaging 9.9% total solids was hauled by a private contractor for disposal on the land.

CONCLUSIONS

The plant continued to operate at slightly above design flows in 1970. Removal efficiencies were not seriously affected, in fact, suspended solids removal was greater than the design value.

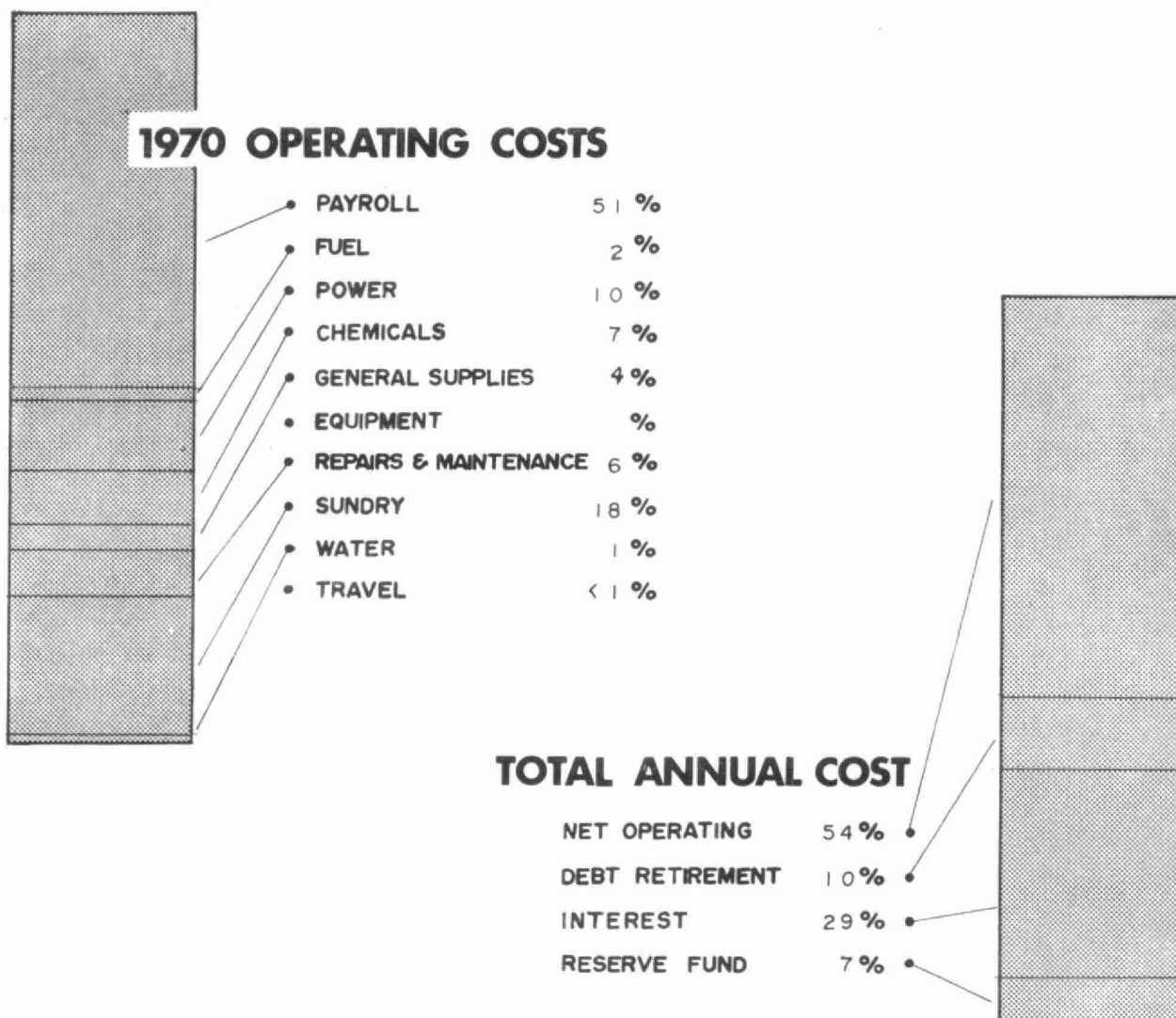
Under Head Office supervision, the plant staff continued the high standard of plant maintenance and operation established in previous years.

PROJECT COSTS

NET CAPITAL COST (Final)	\$822,029.32
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>496,399.44</u>
Long Term Debt to OWRC	<u>\$325,629.88</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	\$ <u>42,072.27</u>
Net Operating	\$ 34,075.73
Debt Retirement	6,571.00
Reserve	4,557.12
Interest Charged	<u>18,243.81</u>
TOTAL	\$ 63,447.66

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 23,875.91
Deposited by Municipality	4,557.12
Interest Earned	<u>1,620.25</u>
	\$ 30,053.28
Less Expenditures	<u>2,799.69</u>
Balance @ December 31, 1970	\$ <u>27,253.59</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	367.78	\$20,703.17	\$56.29	7 cents
1967	480.65	25,872.10	53.83	12 cents
1968	497.54	28,281.17	56.84	17 cents
1969	488.0	35,187.35	72.11	26 cents
1970	485.4	34,075.73	70.20	14 cents

MONTHLY OPERATING COSTS

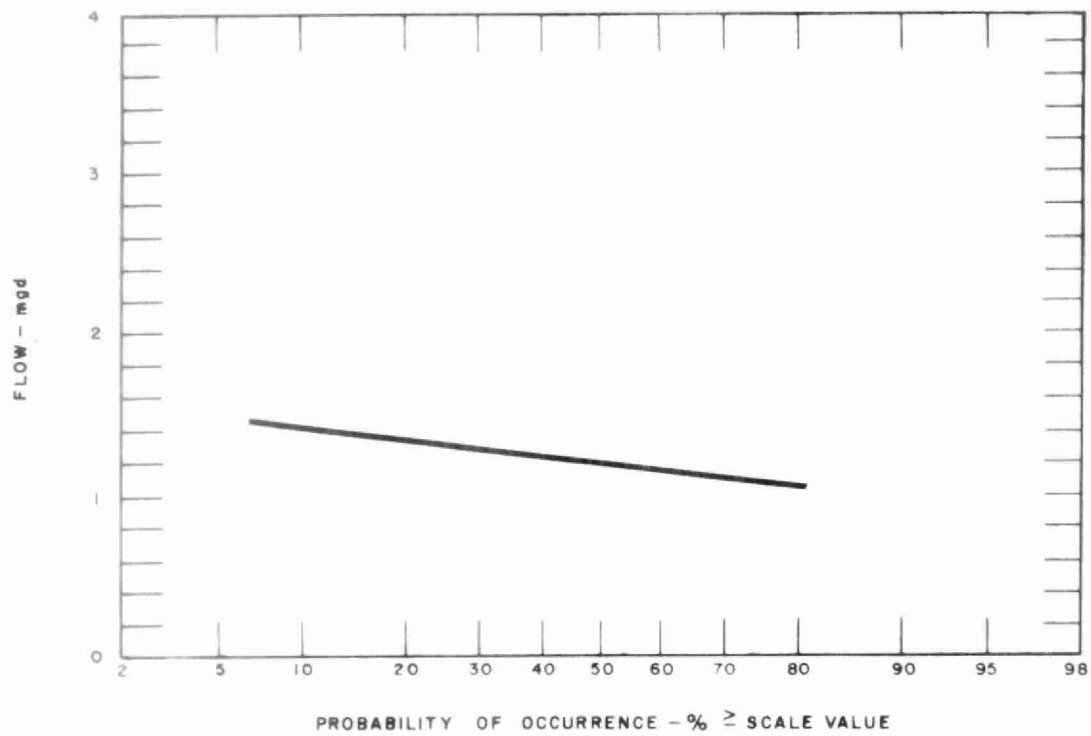
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	TRAVEL	WATER
JAN	2412.21	1718.48	-	-	252.30	-	33.89	-	195.26	212.28	-	-
FEB	3605.95	1246.68	11.99	601.20	357.15	-	94.60	-	328.18	779.00	-	187.15
MAR	2228.38	1260.49	-	256.15	256.69	-	155.29	-	57.48	242.28	-	-
APR	2990.72	1197.40	-	-	303.22	1051.05	147.18	-	33.01	258.86	-	-
MAY	3167.03	1455.92	92.82	(699.51)	259.11	-	58.46	-	312.89	1509.85	-	177.49
JUNE	947.49	1452.17	170.19	42.62	269.07	-	161.08	-	67.50	(1244.14)	29.00	-
JULY	3804.61	1273.45	42.58	95.43	272.73	136.50	186.52	-	113.14	1684.26	-	-
AUG	3313.59	2005.32	194.20	136.90	266.13	-	127.05	-	440.06	143.93	-	-
SEPT	3266.74	1202.77	16.00	-	426.25	-	84.21	-	8.08	1483.89	-	45.54
OCT	2222.16	1242.37	109.10	47.73	276.51	-	64.72	-	100.83	281.03	99.87	-
NOV	3216.33	1309.37	64.37	-	299.40	1352.40	122.41	-	35.79	32.59	-	-
DEC	2900.52	1198.35	16.00	79.09	289.72	-	121.68	-	373.62	822.06	-	-
TOTAL	34075.73	16562.77	717.25	559.61	3528.28	2539.95	1357.09	-	2065.84	6205.89	128.87	410.18

BRACKETS INDICATE CREDIT

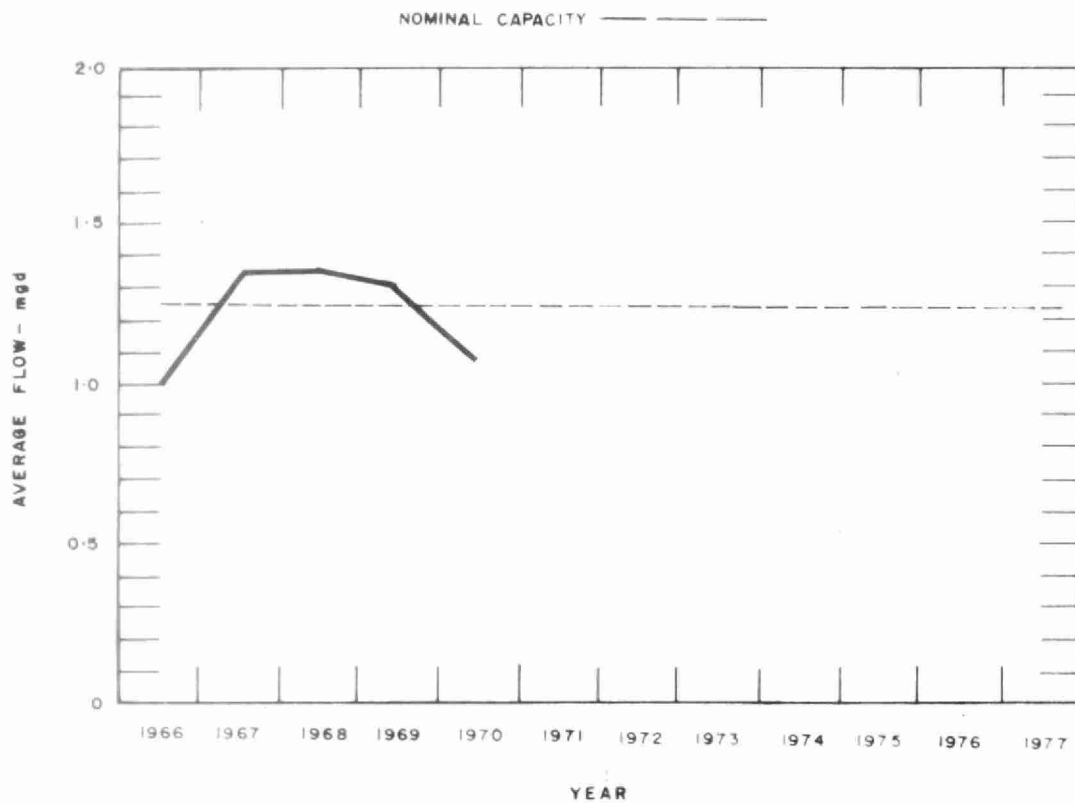
* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$4216.20



PROCESS DATA

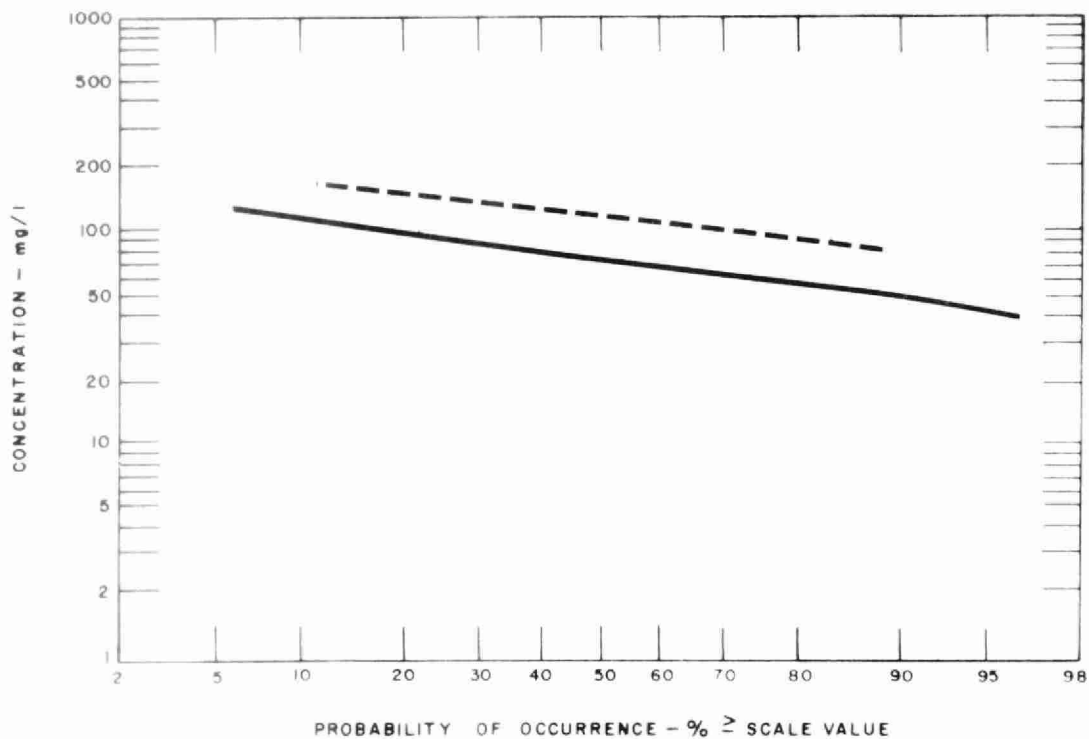


FLAWS

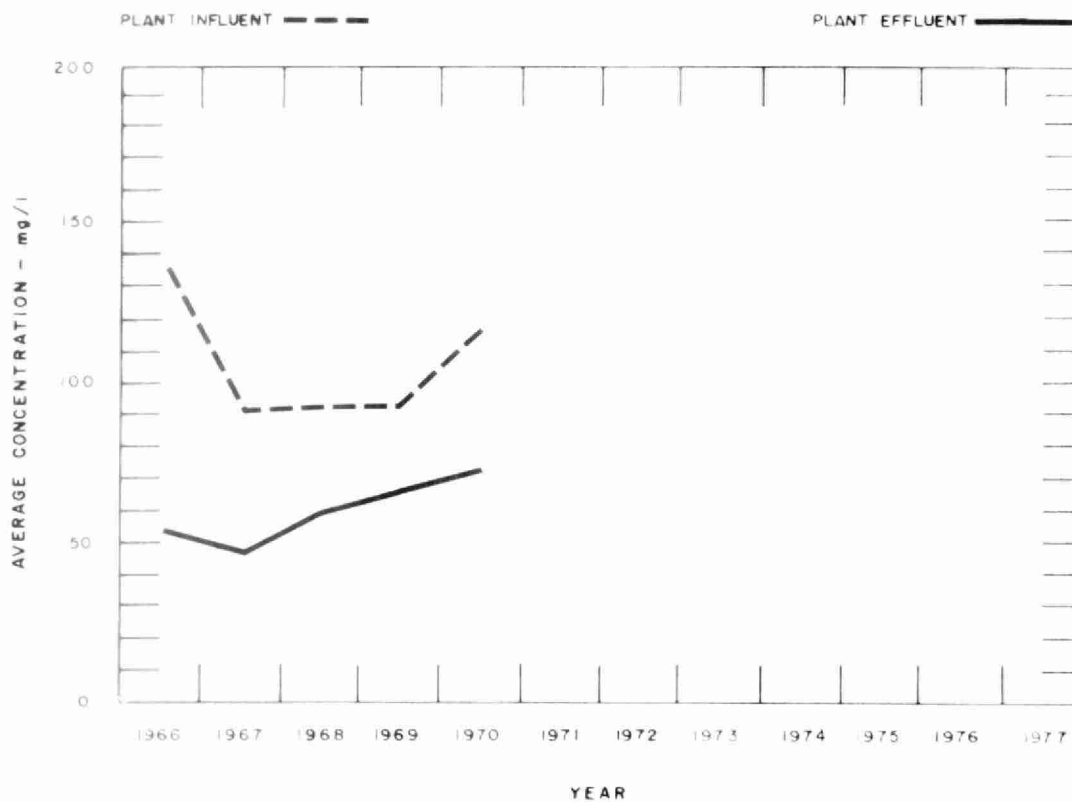


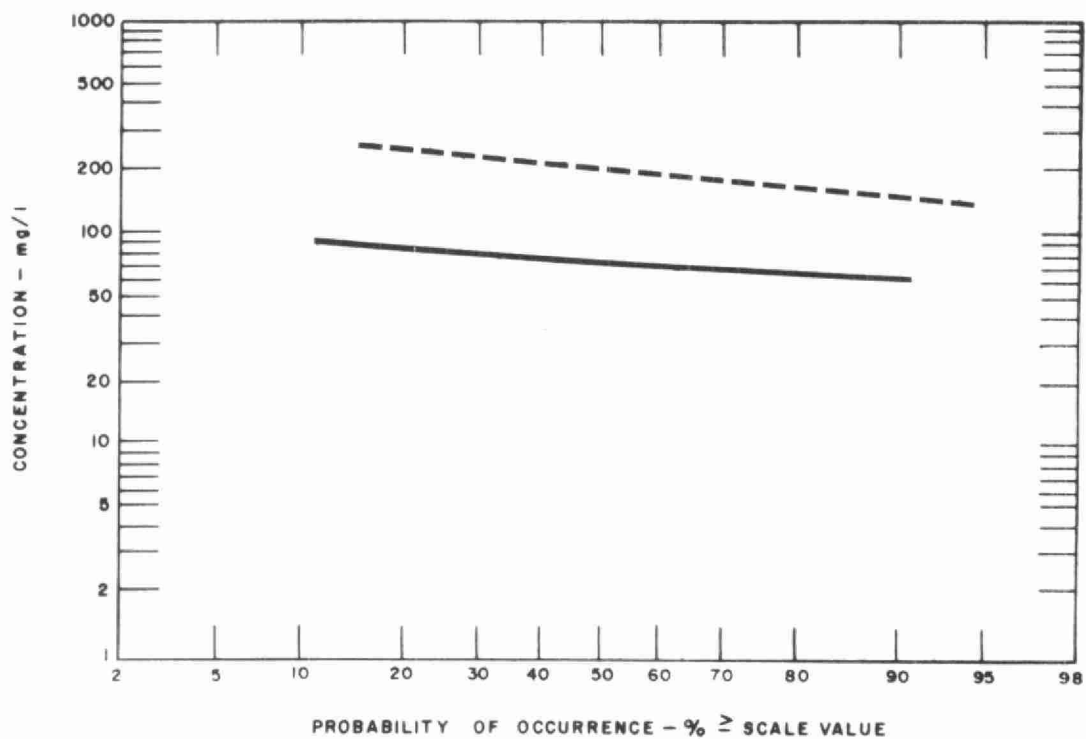
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED ³ 10 pounds	DOSAGE mg/l
JAN	36.3	1.17	1.6	.8	3.0	8.3
FEB	32.8	1.17	1.3	.9	2.5	7.6
MAR	42.7	1.38	2.3	.9	2.9	6.9
APR	47.4	1.58	2.3	1.2	2.6	5.6
MAY	40.4	1.30	1.5	1.1	3.1	7.7
JUNE	38.1	1.27	1.4	1.0	2.6	6.8
JULY	40.8	1.31	1.6	1.1	2.6	6.3
AUG	46.0	1.48	1.4	1.1	2.7	5.9
SEPT	40.0	1.33	1.8	1.1	2.8	6.9
OCT	42.4	1.36	2.1	1.1	2.6	7.6
NOV	39.7	1.32	1.5	1.1	2.6	6.6
DEC	38.8	1.25	2.1	.9	2.3	6.0
TOTAL	485.4	-	-	-	32.9	-
AVERAGE	-	1.33	-	-	2.7	6.8

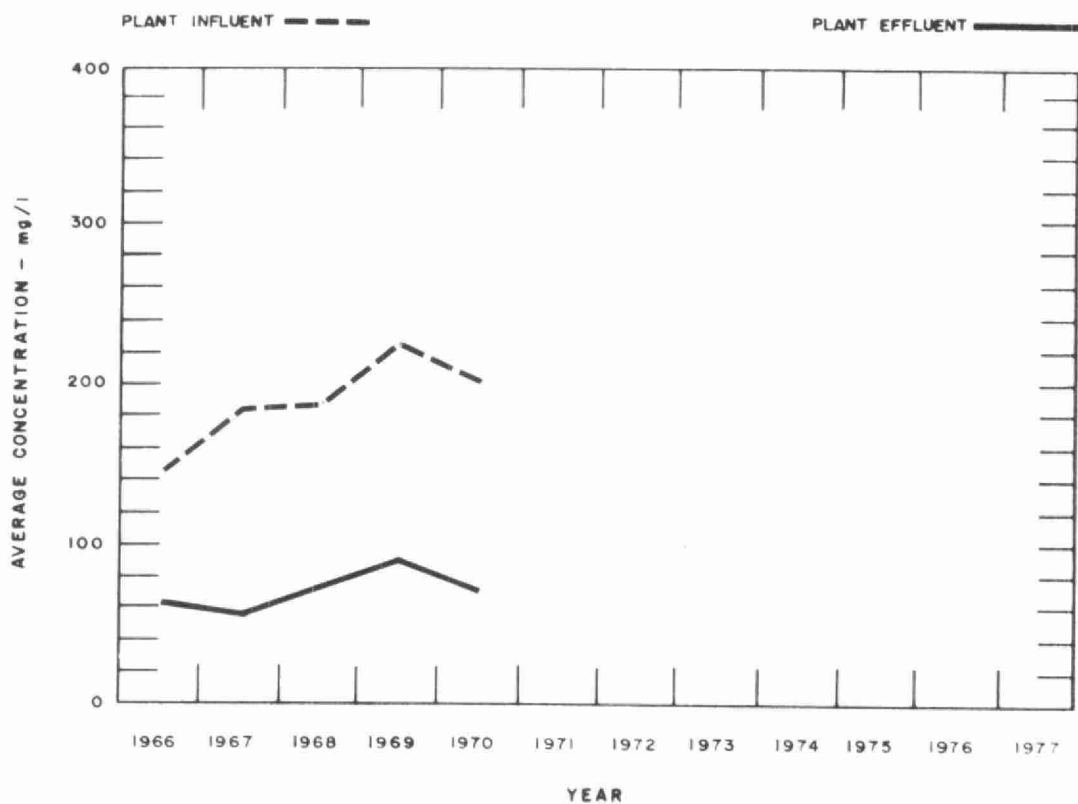


BIOCHEMICAL OXYGEN DEMAND





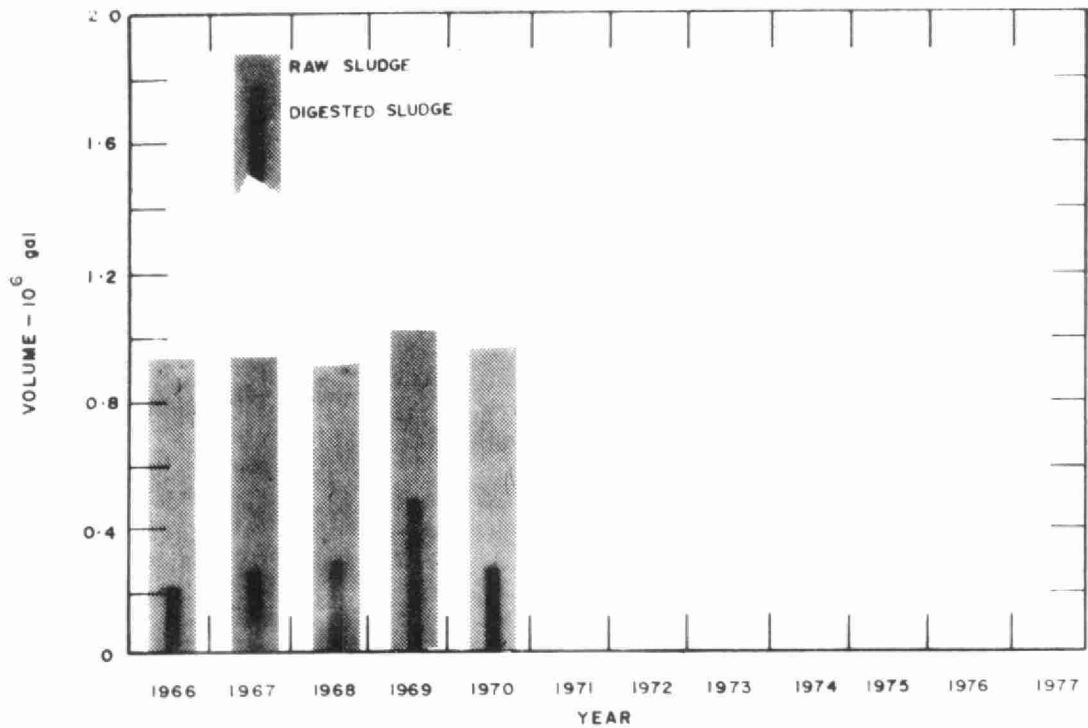
SUSPENDED SOLIDS



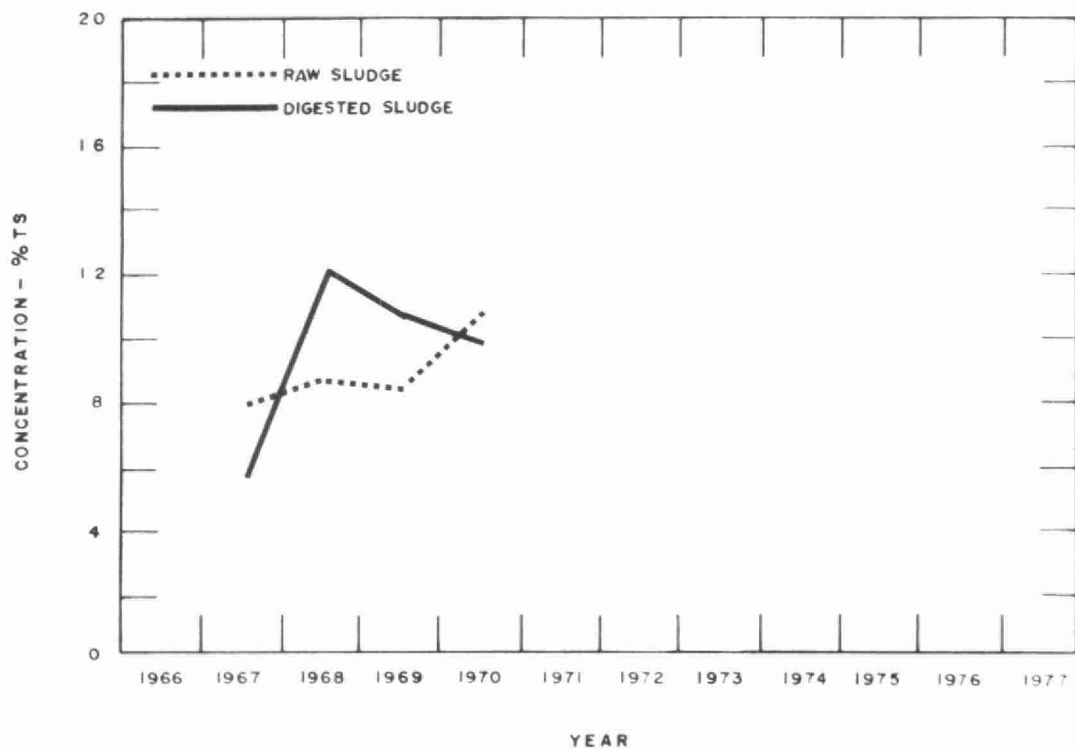
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	1	110	1	34	69	28	1	175	1	65	63	40	18
FEB	2	80	2	62	23	6	2	220	2	62	72	52	35
MAR	2	100	2	75	25	11	2	185	2	72	61	48	31
APR	1	180	1	38	79	67	1	210	1	85	60	59	55
MAY	1	120	1	85	29	14	1	190	1	60	68	52	61
JUNE	2	150	2	110	27	15	2	230	2	98	57	50	67
JULY	1	120	1	85	29	14	1	150	1	60	60	37	195
AUG	1	110	1	100	9	5	1	130	1	70	46	28	54
SEPT	2	127	2	72	43	22	2	235	2	65	72	68	74
OCT	2	120	2	74	38	20	2	220	2	80	64	59	160
NOV	2	87	2	80	8	3	2	205	2	75	63	51	31
DEC	1	160	1	42	73	46	1	190	1	80	58	43	23
TOTAL	18	-	18	-	-	251	18	-	18	-	-	587	804
AVERAGE	-	118	-	74	37	21	-	202	-	74	63	49	67

NOTE - n is the number of samples taken



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	DEWATERED	LIQUID
	10 ³ gal	%	%	10 ³ gal	%	%	10 ³ gal	%	cu yd	cu yd
JAN	73	-	-	32	-	-	41	-		192
FEB	67	13.8	43	26	8.1	45	45	.5		156
MAR	81	6.5	49	28	15.8	34	54	.4		168
APR	86	-	-	20	-	-	66	.4		120
MAY	81	9.4	54	12	-	-	15	-		72
JUNE	74	5.2	55	30	12.5	36	44	.2		150
JULY	81	2.1	47	24	10.1	35	56	-		144
AUG	80	10.5	42	17	-	-	64	.5		102
SEPT	81	14.1	38	26	8.6	32	55	.7		156
OCT	87	17.7	32	26	8.6	28	60	-		156
NOV	79	16.0	47	22	5.8	43	56	-		132
DEC	78	-	-	15	-	-	68	-		90
TOTAL	948	-	-	278	-	-	624	-		1638
AVERAGE	79	10.6	45	23	9.9	36	52	.45		137

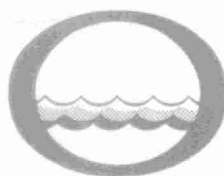
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